Predictors of Knowledge on Kangaroo Mother Care Practice among Postnatal Mothers with Preterm Babies in Tanzania: A Hospital-Based Cross-Sectional Study

Naomi Chamhene
University of Dodoma

Fabiola Vincent Moshi (fabiola.moshi@gmail.com)
University of Dodoma

Research Article

Keywords: KMC, Postnatal mothers, Preterm Babies, Central Tanzania

Posted Date: March 3rd, 2021

DOI: https://doi.org/10.21203/rs.3.rs-257278/v1

Abstract

Background: There is slower progress on decreasing preterm deaths despite of essential newborn care intervention in Tanzania. About 24% of neonatal deaths in Tanzania occur due to prematurity related complications. However, there are limited studies which explain the knowledge level of postnatal mothers on KMC practice in Tanzania, especially in Central zone. Therefore, the purpose of this study was to determine predictors of knowledge on Kangaroo mother care among postnatal mothers of preterm babies in Central zone, Tanzania.

Methods: The study design was an analytical cross sectional involved 363 mothers of preterm babies as participants from three Referral Regional Hospitals in Central zone. Convenience sampling technique was used to get participants in the study where by all postnatal mothers with premature babies who met the inclusion criteria were enrolled until the sample size was attained.Face to face interview using structured questionnaire was used to collect data. Data was analyzed by using SPSS v23. Both univariate and multiple regression analyses were used to determine predictors of knowledge

Results: Majority of postnatal mothers 225(62%) had inadequate knowledge towards KMC. After controlling for confounders, predictors of knowledge on KMC were region a postnatal mother was residing [Singida (AOR=1.990 at 95% CI=1.058-3.741, p=0.033)], age of the mother [women aged ≥30 years(AOR=3.913 at 95% CI=1.038-14.75, p=0.044)], level of education of the mother [women who had secondary education and above (AOR=6.309 at 95% CI=2.305-17.26, p<0.001)] and the family type of a postnatal mother living in (nuclear family AOR=0.521 at 95%CI=0.313-0.866,p=0.012).

Conclusion: Vast majority of postnatal mothers had inadequate knowledge on KMC practice which threatens the health of preterm babies who are discharged home before full development. Postnatal women who were more likely to have inadequate knowledge were those of young age, with low level of education and living in nuclear families. The study recommends care of preterm babies (including KMC) to be included in the antenatal training package in order to prepare them for the care if they gave birth to a preterm baby.

Background

Prematurity is the cause of newborn deaths, and it is considered the second cause of child deaths worldwide [1]. It is estimated that about 15 million of newborn are born premature per annum [2]. Complications of preterm births account for 35% of the global neonatal deaths each year [3]. Preterm births are defined by World Health Organization (WHO) birth before 37 completed weeks of pregnancy gestation or less than 259 days first day of last menstrual period [3]. The Sub-Saharan Africa and Asia experience the highest number of the preterm deaths currently. There are more than 60% of the World's preterm births today. Also, over 80% of neonatal deaths every year are due to preterm related complications [4]. The chances of preterm survival vary greatly depending on their place of birth [1].

However, the risk of death resulting from preterm complications is 12 times higher for African baby than the European baby [5].

Tanzania like many other countries in Africa, experience newborn deaths [6]. Current report showed 20% neonatal mortality rate and 43 deaths per 1000 live births [7]. Prematurity related complications accounts 24% of all neonatal deaths [8]. About 19 deaths per 1000 live births and prematurity related complications accounts for 24% of the neonatal deaths [8]. A study conducted in Mwanza Region revealed 43.4% of neonatal deaths were due to preterm related outcomes which occurred within the first seven days of life. The report showed that about 39.4% and 32.3% neonatal deaths were due to hypothermia and infections respectively [9]. According to the General Assembly resolution of 25th September 2015, all countries should focus on reducing neonatal mortality to at least as low as 12 per 1,000 live births by the end of 2030 [10]

The implementation of Kangaroo Mother Care (KMC) is essential strategy towards reducing preterm/premature deaths. KMC is cost-effective method and if appropriately practiced, it reduces three-quarter of preterm/premature deaths [11]. The KMC is a skin-to-skin contact between the mother/caregivers and child which [12]. It was discovered in 1978 purposively to replace the scarcity of incubators [13]. KMC, apart from maintaining baby's warmth, it promotes exclusive breastfeeding which is appropriate for weight gain of the baby [14].Research based evidence indicate that, KMC should be practiced in a continuum manner more than twenty hours [15]. Furthermore, it is recommended to be practiced intermittently for a few hours in a day [14].

According to World Health Organization (WHO), KMC practice lowers the risks of hypothermia by 66%, reduces neonatal infections by 55% and also lowers the risks of hospital-acquired infection by 61% if compared to the conventional care [16]. Additionally, KMC has been proved to reduce preterm babies' deaths by 40%. Further, babies maintained on KMC were found to have increased body weight and promoted baby-mother attachment [17].Knowledge of postnatal mothers is crucial to KMC practice [18]. Inadequate knowledge on KMC practice have been reported by several studies [18–21]. Research evidence from Ethiopia, confirmed that being knowledgeable on the benefits of KMC increased its practice; and their babies were less likely to develop hypothermia and poor weight gain [22]. Other factors have been documented by one study conducted in India, which highlighted the barriers and enablers to KMC practice. Examples of the enablers included family support, willingness of the mother and the father. Such factors as lack of privacy and motivation, tend to reduce the amount of time spent by the mother on applying KMC to preterm babies [23].

A recent study conducted in Malawi reported that those mothers used carePlus wrap reported 20 or more hours per day of KMC practice, compared to those who used the traditional method (24). Moreover, some women failed to comply to KMC practice due to overwhelmed with responsibilities at home, developing anxiety and fatigue which discouraged them from continuing KMC, and experiencing financial difficulties, lack of support, and stigma, ultimately resulting in following unhealthy, traditional care practices of LBW babies [25,26].

Tanzania, as a country has established NICU services, though they are found only to Regional Referral Hospitals. The services are also provided free of charge. On the other hand, there are limited studies which explain postnatal mothers' knowledge on KMC practice in the country as one of the barriers to KMC practice. Therefore, this study aimed to assess the level of knowledge on Kangaroo mother care among postnatal mothers of preterm babies in Central zone Tanzania.

Methods

Study design and setting

A hospital-based cross-sectional study was conducted in the Central Zone of Tanzania from April to July 2020. The zone is made up of three regions namely, Singida, Tabora and Dodoma. Each region has one Regional Referral Hospital where there is Neonatal Intensive Care Unit (NICU) and the KMC unit for preterm care.

Inclusion and Exclusion Criteria All post-natal mothers with stable preterm babies of one to four months post-delivery and practicing KMC were included in the study.

The study involved all postnatal-mothers with stablepreterm of one up to four months post-delivery who were practiced KMC and attending at preterm units/clinics from Singida, Tabora and Dodoma Regional Referral Hospitals. Those postnatal mothers with preterm babies who severely ill, and those preterm babies identified to have severe congenital abnormalities were excluded from the study.

Sample Size and Sampling Technique

A Kish Leslie (1965) formula $(n=z^2P\ (1-P)/d^2)$ was used to calculate the minimum sample size. The proportion of 38.4% of factors associated with mortality among premature babies conducted in Mwanza, Tanzania [9]. The calculation ($1.96^2x0.384\ (1-0.384)/0.05^2$) yielded a total of 363 sample size. The required sample size was selected from three regional referral hospitals available in the central zone (Dodoma, Singida and Tabora). Proportionate sampling technique was employed to recruit representative samples per each regional referral hospital. This was done after the total monthly attendance of preterm babies per clinic from each RRH. The proportional samples was computed by $ni=(n/N)Ni$,where n_i=minimum sample size per facility, n=total sample size, N=total number of preterm babies from all facilities, and Ni = number of premature babies from each RRH. Therefore, the distribution of study representative per facility was; Dodoma RRH138(38%); Singida RRH 113(31.1%); and Tabora RRH112(30.9%).A systematic sampling technique was thereafter used to get participants from Tabora and Dodoma region. However, Singida regional referral hospital because of its small number of preterm babies; therefore all babies found on the day of data collection were included in the study.

Data Collection Procedure

Data regarding postnatal knowledge on KMC practice was collected using a structured questionnaire. The questionnaire was adopted and modified from the Facilitators Guide for Training of Kangaroo Mother Care (2,27,28). Before filling the questionnaire, the researchers created rapport and introduced themselves including the purpose of the research to the participants. The researcher identified a private place within the KMC unit were the interview was conductedto assure confidentiality and promote freeness of respondents to answer questions. All study respondents answered the same questions about KMC. Mothers of premature babies were interviewed to obtain the sociodemographic characteristics and the information of knowledge of KMC.

Validity and reliability

The principal researcher trained research assistants on the tools to ensure accurate interview and filling of the questionnaire. The questionnaire was tested for internal consistency using Cronbach's alpha test which found 0.7. The tool was also pretested to assess for answerability of the items in the questionnaire.

Measurement of Variables

On testing the level of knowledge to postnatal mothers, 10 multiple choice questions were asked to respondents. Each item had A, B, C, D sub-items. Each correct response scored 1 point, while wrong response scored 0 point. There were 40 points in total in which those who scored 21 points were considered correct responses. The cut of points for knowledge level of respondents was 10.5 mean scores. Those who fell below the mean score were considered to have inadequate knowledge and vice versa [29,30].

Data Analysis

Data was checked for accurate filling before they were entered into the SPSS software v23. Data were then transformed and recoded into analyzable manner. Descriptive statistics was done to analyze the social demographic characteristics of the study participants to determine the frequency and percentages of each variable. Means and standard deviation were also used to present continuous variables. All continuous variables were transformed into categorical variables for binary logistic regression analysis. To determine the association between level of knowledge of postnatal mothers on KMC, and sociodemographic characteristics, Chi square values was presented at 95% CI interval with p-value <0.05 was considered as statistical significant. Both Univariate and Multivariate logistic regression analysis was used to determine the extent of association between knowledge and other significant variables.

Ethical Considerations

Before conducting the study, an ethical clearance letter from the University of Dodoma Ethical Review Committee was granted for the approval of the study. In addition to that, permission to conduct the study was granted by the Regional Administrative Secretary (RAS) of Dodoma, Tabora and Singida as well as regional referral hospitals medical officer in- charges respectively. All participants were given detailed

information about the aim of the study. A verbal and written consent was sought from respondents before interview. The respondents were ensured of confidentiality and freedom of participation in the study.

Results

Socio-Demographic Characteristics

Table 1 summarizes social-demographic characteristic of the participants. The age distribution of respondents ranged from 17 to 46 years, with the mean age of 27 (SD ± 6.654). Majority of study respondents 194(53.4%) were aged between 20-29 years followed by age above 30years 124(34.2%). Most of participants 159(43.8%) were having secondary education and above, 252(69.4%) were married, and 183(50.4%) were employed. On the other hand, 207(57%) respondents were from urban and 197(54.3%) were from nuclear type of family. The parity of most respondents was multipara 189(52.1%) and SVD mode had a high proportion 351(96.7%), Table 1.

Postnatal Mothers' Knowledge of KMC Practice

The research findings indicated that 225(62%) of the participants had inadequate knowledge on KMC practice, while only thirty eight percent had adequate knowledge on KMC practice, Figure 1.

Factors Influencing Postnatal Knowledge on KMC Practice

Chi square analysis was done to determine the association between sociodemographic characteristics and knowledge. The results of Chi square for [Region (□2=6.138; P=0.046)], [age group (□2=18.919; P<0.001)], [education level (□2=54.878; P<0.001)],[occupation □2=24.943; P<0.001) [residence(□2=17.780; P<0.001)], [family type (□2=17.198; P<0.001)] and [parity (□2=8.954; P<0.011)] showed significant association with knowledge level on KMC practice (Table 2).

Predictors of KnowledgeofKMC Practice Among Postnatal Mothers

Binary and Multi logistic regression was done to determine the significant association between sociodemographic characteristics and knowledge. After controlling for confounders, the predictors of knowledge on KMC among postnatal mothers on KMC practice; those women resided inSingida were almost 2 times more likely to have adequate knowledge compared to Tabora (AOR=1.990 at 95% CI=1.058-3.741, p=0.033), women aged ≥30 years were nearly 4 times more likely to have adequate knowledge than their counterparts (AOR=3.913 at 95% CI=1.038-14.75, p=0.044). Other factors which showed statistical significance were education level, whereby all women who had secondary education and above were six times more likely to have adequate knowledge (AOR=6.309 at 95% CI=2.305-17.26, p<0.001) and mothers from extended family were two times more likely to have adequate knowledge(AOR=2.055 at 95%CI=1.263-3.343,p=0.004) Table 3.

Discussion

In this study it was revealed that more than a half of postnatal mothers had inadequate knowledge on KMC practice. Our findings was nearly similar to the findings of the study done in India [31] and [32] which showed also inadequate knowledge of KMC among postnatal mothers.The results were inconsistent with two studies done in Ethiopia which assessed the same factor, showed nearly two-third of the study respondents were knowledgeable on KMC practice [33]. The observed differences might be due to variation in samples size and other factors like socio-demographic characteristics of participants.

The current study further indicated knowledge level difference between regional hospitals involved in the study area. Respondents attended in Singida regional hospital were nearly two times more likely to have adequate knowledge on KMC practice compared to the reference category. A multi-country study in elsewhere in Africa found similar findings which showed that those health facilities with good supportive supervision, integrated KMC into their quality improvement, continuity of care, high-level buy-in and support for kangaroo mother care implementation, and client-oriented careon KMC practice (34). This might be the reason for the observed institutional differences for the current study.

We observed that three-quarter of the uneducated postnatal mothers were having inadequate knowledge on KMC practice. After doing adjusted for confounders, postnatal mothers with secondary education and above had 6-folds as likely to have adequate knowledge on KMC practice. This findings was consistent to a study done in Ethiopia which found that postnatal mother who completed grade 1 to 4 were over three-folds as likely to practice KMC [35]. Education level of a person has a positive and significant influence on healthcare utilization, including KMC practice [36]. Study done in India reported that education level of postnatal mother have relationship with knowledge of newborn care [37].

We also found that, thirty years and above aged mothers were almost 4 times more likely to have adequate knowledge on KMC compared to their counterparts. The study done in Mwanza Tanzania cemented that, there was significant higher mortality in preterm baby born to young mothers since they lacked knowledge to practice KMC [38]. The reason of having inadequate knowledge might be due limited information on KMC during ANC as majority of distant health facilities lacked KMC services. This reason was also argued by [39].

Our study further showed significant association between parity and postnatal mother’s knowledge on KMC practice. Grand-multipara women had reduced likelihood of having inadequate knowledge on KMC practice compared to their counterparts. Contrary to this study, a study done on knowledge and associated factors of postnatal mothers towards essential newborn care practices found that those postnatal mothers who were primpara were almost two-folds more likely to have poor knowledge compared to grand-multipara [29].

Furthermore, our study showed positive association between knowledge of KMC practice and the type of family the motheris living in.Those mothers from extended family were two times likely to have adequate knowledge on KMC practice compared to the mothers from nuclear family. Studies conducted elsewhere

documented the importance of family support on KMC practice to the mother after home discharge [40,41], although did not indicate the knowledge differences between type of families. In the extended family, the inhabitants are beyond father, mother and children; where possibly, they might have learned from one another, should one among them ever experienced similar problem in the family, compared to nuclear family whereonlyhusband and wife live. The research evidence from elsewhere support the premise that household responsibilities may be a barrier to KMC practice [23] and this might be the cause for the increased more folds of extended family to have adequate knowledge than nuclear family where possibly, the mother becomes the responsible individual to household chores.

Conclusion

Majority of interviewed postnatal mothers had inadequate knowledge on KMC practice which threatens the health of preterm babies who are discharged home before full development. Postnatal women who were more likely to have inadequate knowledge on KMC practice were those of young age of less than 30 years, those with low level of education and those living in nuclear families. The study recommends deliberate efforts on improving postnatal mothers 'knowledge on KMC practice, one of the strategies being initiating care of preterm babies in the antenatal package to prepare these mothers in case they have one.

Abbreviations

ANC

Antenatal Care
KMC
Kangaroo Mother Care
NICU
Neonatal Intensive Care Unit
UNICEF
The United Nations Children's Fund
WHO
World Health Organization

Declarations

Ethics approval and consent to participate

Ethical clearance letter from the University of Dodoma Ethical Review Committee was granted for the approval of the study. Permission to conduct the study was granted by the Regional Administrative Secretary (RAS) of Dodoma, Tabora and Singida as well as regional referral hospitals medical officer in-charges respectively. All participants were given detailed information about the aim of the study. Averbal

and written consentwas sought from respondents before interview. For illiterate women verbal consent was sought and a figure print signing was obtained before they were enrolled to the study. The respondents were ensured of confidentiality and freedom of participation in the study. All methods were performed in accordance with the relevant guidelines and regulations.

Consent for publication

Not applicable

Availability of data and material

The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

Competing interests

Authors declare that there is no competing interest

Funding

The study was not funded

Acknowledgments: we acknowledge the Regional administrative authorities for granting us the permission to conduct the study in their Regional Referral Hospital

Authors' contributions

NC wrote the first draft of the manuscript. FVM guided the writing of the manuscript. All authors reviewed the manuscript.

References

1. Lawn et al. Born too soon:The global Action Report on Preterm Birth [Internet]. Vol. 25, World Health Organization. Geneva. 2012. 133–136 p. Available from: http://www.who.int/about/licensing/copyright_form/en/index.html
2. Mfuh A, Lukong C, Adamu' H. Knowledge and practice of kangaroo mother care among post-natal mothers in a tertiary hospital in north western Nigeria. Int J Med Heal Res Int [Internet]. 2019;5(1):224–8. Available from: www.medicalsciencejournal.com
3. Blencowe H, Cousens S, Chou D, Oestergaard M, Say L, Moller AB, et al. Born Too Soon: The global epidemiology of 15 million preterm births. Reprod Health. 2013;10(SUPPL. 1):1–14.
4. Wagura P, Wasunna A, Laving A, Wamalwa D, Ng P. Prevalence and factors associated with preterm birth at kenyatta national hospital. BMC Pregnancy Childbirth. 2018;2–9.

5. Berhe T, Gebreyesus H, Desta H. Determinants of preterm birth among mothers delivered in Central Zone. BMC Res Notes [Internet]. 2019;10–5. Available from: https://doi.org/10.1186/s13104-019-4307-z
6. Dhingra U, Gittelsohn J, Suleiman AM, Suleiman SM, Dutta A, Ali SM, et al. Delivery, immediate newborn and cord care practices in Pemba Tanzania: A qualitative study of community, hospital staff and community level care providers for knowledge, attitudes, belief systems and practices. BMC Pregnancy Childbirth. 2014;14(1).
7. UNICEF. Levels & Trends in Child Mortality. 2020.
8. United Nations Children's Fund. Leading Causes of Neonatal Deaths in the United Republic of Tanzania 2017 [Internet]. Tanzania, United Republic of Healthy Newborn Network. 2017. Available from: https://www.healthynewbornnetwork.org/country/tanzania-united-republic-of/
9. Mbawala1 GB, Fredrick F, Kamugisha E, Konje E, Hokororo A. Factors associated with mortality among premature babies admitted at Bugando medical centre, Mwanza - Tanzania. East Afr J Public Health [Internet]. 2014;11(January). Available from: https://www.researchgate.net/publication/266208767%0AFactors
10. United Nations. A/RES/70/1 Transforming our world: the 2030 Agenda for Sustainable Development. 2015;16301(October):1–35. Available from: (A/70/L.1)
11. Lawn JE, Mwansa-kambafwile ÃJ, Horta BL, Barros FC, Cousens S. ' Kangaroo mother care ' to prevent neonatal deaths due to preterm birth complications. 2010;144–54.
12. Vesel L, Bergh A, Kerber KJ, Valsangkar B, Mazia G, Moxon SG, et al. Kangaroo mother care: a multi-country analysis of health system bottlenecks and potential solutions. BMC Pregnancy Childbirth. 2015;15(Suppl 2):1–16.
13. Conde-Agudelo A, Díaz-Rossello JL. Kangaroo mother care to reduce morbidity and mortality in low birthweight infants. Cochrane Database Syst Rev. 2016;2016(8).
14. Bergh A, Charpak N, Rooyen E Van. Education and training in the implementation of kangaroo mother care. South African J child Heal [Internet]. 2012;Vol. 6 No.(January 2016). Available from: https://www.researchgate.net/publication/277773328
15. WHO. WHO recommendations on interventions to improve preterm birth outcomes. Geneva: WHO; 2015.
16. World Health Organization. WHO recommendations on interventions to improve preterm birth outcomes [Internet]. Geneva: WHO; 2015. Available from:
17. Gertrude Sibuchi Kampekete, Catherine Ngoma MM. Acceptance of kangaroo mother care by mothers of premature babies. 2018;(November). Available from: https://www.researchgate.net/publication/328913334
18. Kumari A, Sarin J, Bankim S, Singh C. Kangaroo mother care: Knowledge and practices of postnatal mothers of low birth weight babies. Int J Appl Res [Internet]. 2019;5(1):6–9. Available from: www.allresearchjournal.com

19. Solomons N, Rosant C. Knowledge and attitudes of nursing staff and mothers towards kangaroo mother care in the eastern sub-district of Cape Town. S Afr J Clin Nutr. 2012;25(1):33–9.
20. Geetha S, Hemavathy P V. Effectiveness of Kangaroo Mother Care among the Mothers of Hospitalized Newborn. Int J Innov Res Sci Eng Technol. 2015;4(2):151–4.
21. Kiwanuka A, Tarabani S, Mbao EH, Kisanga F. Challenges Facing Mothers Who Practice Kangaroo Mother Care in Health Facilities; A Case of Dar es Salaam. Int J Nurs Heal Sci [Internet]. 2017;4(5):58–62. Available from: http://www.openscienceonline.com/journal/ijnhs
22. Roba AA, Binoy S, Naganuri MA. Knowledge, attitude and practice of kangaroo Mother care by postnatal mothers who gave birth to Preterm and Low Birth weight babies in public hospitals, Eastern Ethiopia. J Neonatal Biol. 2017;6(3).
23. Dawar R, Nangia S, Thukral A, Chopra S, Khanna R. Factors Impacting Practice of Home Kangaroo Mother Care with Low Birth Weight Infants Following Hospital Discharge. 2019;1–8.
24. Chavula K, Guenther T, Valsangkar B, Lwesha V, Banda G, Wensaas MB, et al. Improving skin-to-skin practice for babies in kangaroo mother care in Malawi through the use of a customized baby wrap: A randomized control trial. PLoS One. 2020;15(3):1–16.
25. Lydon M, Longwe M, Likomwa D, Lwesha V, Chimtembo L, Donohue P. Starting the conversation: community perspectives on preterm birth and Kangaroo mother care in southern Malawi. J Glob Health. 2018;8(1):010703.
26. Chisenga J, Chalanda M, Ngwale M. Kangaroo mother care: a review of mothers' experiences at Bwaila Hospital and Zomba Central Hospital (Malawi). Midwifery. 2015;3(2):305–15.
27. UNICEF. Facilitators Guide for Training on Kangaroo Mother Care. New York; 2018. 1–44 p.
28. MCHIP. Kangaroo mother care: Implementation guide [Internet]. Washington, D.C 20036, USA: JHPIEGO; 2012. 1–70 p. Available from: papers3://publication/uuid/8067A89D-AE92-4E5D-BF07-1C0573F37305
29. Berhan D, Gulema H. Level of knowledge and associated factors of postnatal mothers' towards essential newborn care practices at Governmental Health Centers in Addis Ababa, Ethiopia. Adv Public Heal. 2018;2018:1–10.
30. World Health Organization. Standards for improving quality of maternal and newborn care in health facilities. 2016;
31. Urmila K V, Ravikumar, Karunakaran U. Study to assess the knowledge, attitude and practice of Kangaroo mother care among post-natal mothers in a tertiary care centre of. Int J Contemp Pediatr. 2018;5(3):992–6.
32. Ramaiah P, Mokh AMB. A study to determine the knowledge and practice regarding Kangaroo mother care among postnatal mothers of preterm babies at rural centres in India. J Nurs Care. 2016;5(4):4172.
33. Kassahun G, Efa A, Samuel H. Knowledge, attitude, practice and associated factors of Kangaroo Mother care for neonatal survival among care takers of preterm and low birth weight infants in health care settings. J Heal Med Nurs. 2019;58:42–7.

34. Bergh A-M, Kerber K, Abwao S, De-Graft Johnson J, Aliganyira P, Davy K, et al. Implementing facility-based kangaroo mother care services: Lessons from a multi-country study in Africa. BMC Health Serv Res. 2014;14(1):293.
35. Kassa D, Tadele H, Tadesse BT, Alemayehu A, Abuka T, Woldegebriel F, et al. Improving practice of institutional delivery in Southern Ethiopia. Res Sq. 2019;1–18.
36. Agyemang S, Asibey BO. Effect of education on health care utilization in rural ghana: the case of selected communities in the Bekwai Municipality. KNUST J Geogr Dev [Internet]. 2018;2(1). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6289501/pdf/pone.0208984.pdf
37. Castalino F, Nayak BS, Souza DA. Knowledge and Practices of Postnatal Mothers on Newborn Care in Tertiary Care Hospital of Udupi District. Nitte Univ J Heal Sci [Internet]. 2014;4(2):98–101. Available from: http://nitte.edu.in/journal/June2014/98-101.pdf
38. Mbawala GB, Hokororo A, Fredrick F, Erasmus K, Konje E. Factors associated with mortality among premature babies admitted at Bugando medical centre, Mwanza - Tanzania ADMITTED AT BUGANDO MEDICAL CENTRE, MWANZA - TANZANIA. East Afr J Public Health [Internet]. 2014;11(1). Available from: https://www.researchgate.net/publication/266208767%0AFactors
39. Mathias CT, Mianda S, Ginindza TG. Facilitating factors and barriers to accessibility and utilization of kangaroo mother care service among parents of low birth weight infants in Mangochi District, Malawi : a qualitative study. 2020;1–12.
40. Liu X, Li Z, Chen X, Cao B, Yue S, Yang C, et al. Utilization pattern of kangaroo mother care after introduction in eight selected neonatal intensive care units in China. BMC Pediatr. 2020;20(1):260.
41. Chan GJ, Labar AS, Wall S, Atun R. Kangaroo mother care: a systematic review of barriers and enablers. Bull World Health Organ [Internet]. 2016;94(2):130–41. Available from: https://www.who.int/bulletin/volumes/94/2/15-157818/en/

Tables

Table 1: Background information of respondents (n=363)

Characteristics	Frequency	Percent (%)
Age of the mother		
Less than 19 years	45	12.4
20 - 29 years	194	53.4
More than 30 years	124	34.2
Level of Education		
No education	51	14.0
Primary education	153	42.1
Secondary and above	159	43.8
Marital status		
Married	252	69.4
Not married	111	30.6
Occupation		
Employed	183	50.4
Peasant	110	30.3
Housewife	70	19.3
Place of residence		
Urban	207	57
Rural	156	43
Type of family setup		
Nuclear family	197	54.3
Extended family	166	45.7
Parity		
Primpara	151	41.6
Multipara	189	52.1
Grand multipara	23	6.3
Mode of delivery		
SVD	248	68.3
C/S	115	31.7

ANC Visits		
Inadequate	225	62
Adequate	138	38

Table 2:Factors influencing postnatal mothers' knowledge on KMC practice (n=363)

Variable	Knowledge level		2	p-value
	Inadequate n(%)	Adequate n (%)		
Region				
Dodoma	80(58)	58(42.0)		
Singida	65(57.5)	48(42.5)		
Tabora	80(71.4)	32(28.6)	6.138	0.046
Age group				
≤19	41(91.1)	4(8.9)		
20 to 29	115(59.3)	79(40.7)		
≥30	69(55.6)	55(44.4)	18.919	<0.001
Education				
No education	44(86.3)	7(13.7)		
Primary education	129(73.3)	47(26.7)		
Secondary +	52(38.2)	84(61.8)	54.878	<0.001
Marital status				
Married	149(59.1)	103(40.9)		
Not married	76(68)	35(31.5)	2.854	0.091
Occupation				
Employed	95(51.9)	88(48.1)		
Peasant	89(80.9)	21(19.1)		
Housewife	41(58.6)	29(41.4)	24.943	<0.001
Place of residence				
Urban	109(52.7)	98(47.3)		
Rural	116(74.4)	40(25.6)	17.780	<0.001
Family type				
Nuclear	103(52.3)	94(47.7)		
Extended	122(73.5)	44(26.5)	17.198	<0.001
Parity				
Prime para	103(68.2)	48(31.8)		

Multi para	104(55)	85(45.0)		
Grand multipara	18(78.3)	5(21.7)	8.954	0.011
ANC visits				
Inadequate	152(65.5)	80(34.5)		
Adequate	73(55.7)	58(44.3)	3.407	0.065

Table 3: Bivariate and multivariate logistic regression analysis results for factors influencing postnatal mothers' knowledge on KMC practice (n=363)

Variable	OR	95%CI		p-value	AOR	95%CI		p-value
		Lower	Upper			Lower	Upper	
Region								
Tabora	1				1			
Dodoma	1.812	1.065	3.083	0.028	1.656	0.899	3.051	0.105
Singida	1.846	1.061	3.213	0.030	1.990	1.058	3.741	0.033
Age group								
<19 yrs.	1				1			
20 to 29 yrs.	7.041	2.425	20.44	0.001	2.921	0.887	9.620	0.078
30 > yrs.	8.170	2.758	24.21	0.001	3.913	1.038	14.75	0.044
Education								
No education	1				1			
Primary education	2.290	0.965	5.437	0.060	1.858	0.719	4.801	0.201
Secondary and above	10.154	4.257	24.22	0.001	6.309	2.305	17.26	0.001
Occupation								
Housewife	1				1			
Employed/business	1.310	0.750	2.286	0.343	1.011	0.527	1.939	0.974
Peasant	0.334	0.170	0.654	0.001	0.617	0.274	1.389	0.244
Parity								
Prime para	1				1			
Multi para	1.754	1.122	2.741	0.014	1.209	0.668	2.187	0.531
Grand multipara	0.596	0.209	1.701	0.333	0.514	0.146	1.811	0.030
ANC Visits								
Inadequate	1				1			
Adequate	1.510	0.974	2.340	0.066	0.950	0.567	1.592	0.844
Marital Status								
Not married	1				1			
Married	1.501	0.936	2.408	0.092	1.223	0.679	2.202	0.502
Family type								

Extended family	2.530	1.624	3.944	<0.001	2.055	1.263	3.343	0.004
Nuclear family	1				1			

Figures

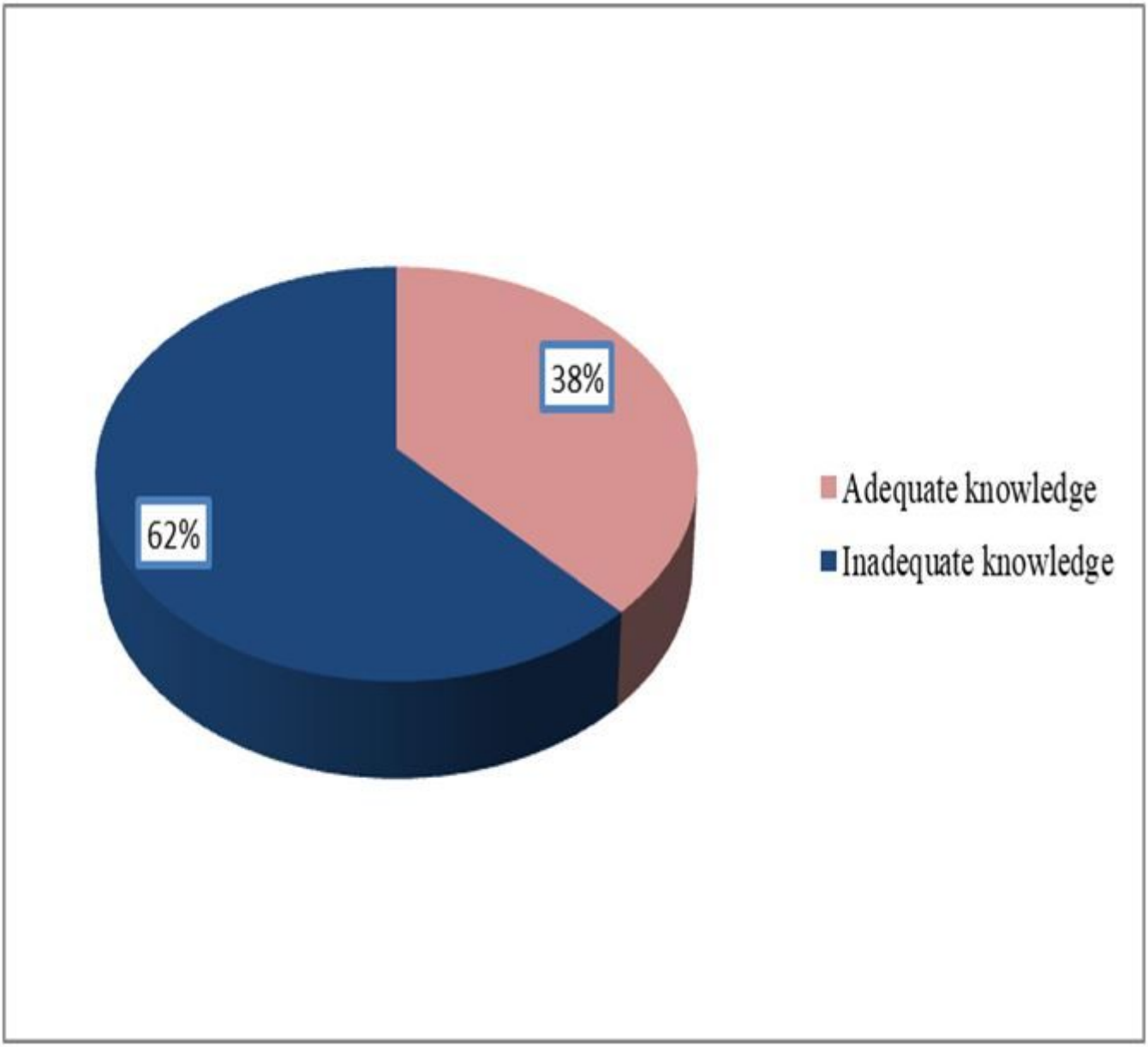

Figure 1

Knowledge of postnatal mothers on KMC